

Review #2.

GENERAL COMMENTS

This is a well-written paper that describes in detail the SWOOSH database. It documents all source data sets for SWOOSH as well as how the raw data from the individual satellite-based instruments are combined into a variety of zonal mean monthly mean products. The paper provides the appropriate documentation for the SWOOSH database that is likely to be used by a wide range of researchers in stratospheric dynamics, chemistry, and radiative transfer. I think that it needs to be made clearer in the abstract whether SWOOSH is (a) a collation of satellite-based measurements from multiple instruments in one big database, or (b) a merged data product (comprising zonal mean monthly mean values), or (c) both. I have made a few specific comments below which the authors should address before the paper is accepted for publication. However these are generally minor comments and it should not be a significant amount of work for the authors to bring this paper to a state where it can be published in ESSD.

We thank the reviewer for their general comments. SWOOSH contains both the data records from individual satellites, as well as a merged product, as we state in the abstract – “SWOOSH includes both individual satellite source data as well as a merged data product.”

SPECIFIC COMMENTS

Page 2, line 9: Regarding "homogeneous and accurate". Do you mean homogeneous in space and time or just in time? And by accurate do you mean unbiased or of low random uncertainty?

By homogeneous we mean free of artificial jumps in time, and by accurate we mean unbiased. We have changed the wording in the manuscript to be clearer in regards to this point.

Page 2, line 20: Are changes in surface UV radiation really considered a "climate impact"?

For clarity we removed the word “climate” in this sentence.

Page 3, line 23: I would suggest replacing "diurnal variability" with "the diurnal cycle in ozone".

Fixed

Page 5, line 25: The whole profile is excluded, not just the values between 30 and 50 km?

Yes, as per the recommendations of Wang et al (2002). We added the word "entirely" to make clear that the entire profile is removed if this criterium is met.

Page 6, line 15: Do comparisons of the ozone product retrieved from the 183 GHz channel and the product retrieved from the 205 GHz channel provide useful information on the uncertainties on 205 GHz ozone data that you are using?

We are unaware of any studies specifically comparing the two. The Livesey et al 2003 paper we cite contains an independent comparison to ozonesondes that forms the basis for their recommendation of using the 205 GHz product.

Page 8, line 5: You're talk here about instruments not variables so better to replace "ozone" with "ozonesonde".

*Page 8, line 5 reads "**3 In situ balloon measurements vs. satellite observations: Choosing a reference satellite measurement**", so we don't understand this comment.*

Page 14, line 23: This is a very contorted description of equivalent latitude. Why not just say: the equivalent latitude associated with a prescribed PV value is that latitude which encloses the same area as the PV isoline?

We have clarified the definition in the text.

Page 14, line 24: I think that you should make it clear that this applies only for long-lived tracers.

Done

Page 14, line 29: How relevant/useful is the equivalent latitude at low geographic latitudes where PV is less representative of the behaviour of a passive tracer? I think that other people have used a hybrid latitude that is equivalent latitude poleward of 50 degrees and true latitude equator-ward of 30 degrees with a transition zone in between.

The reviewer brings up a good point that at low geographic latitudes PV-based equivalent latitude is not particularly useful. We have added a warning in the last paragraph of section 4.2.

Page 17, line 19: I agree with what is written here and it concerns me. Researchers using the equivalent latitude filled geographical data will often end up using monthly mean zonal means that are biased low. Aren't you contaminating your geographical latitude data set by doing this?

We have altered this sentence to read as a warning to users. However, as the "equivalent latitude filled" products we provide are in addition to and separate from the regular geographically gridded products, we don't agree that we are "contaminating" the geographical latitude data set. If users don't want to use the "equivalent latitude filled" products, they can simply use the regular geographic gridded products.

Page 17, line 29: I think that this "radial basis function interpolation with an inverse multiquadric function" needs to be explained more thoroughly. Can the actual equations used be provided e.g. in an appendix?

A review of this type of interpolation is beyond the scope of this paper. We've added a reference to the Hardy review of multiquadric functions, and have documented our implementation of the interpolation using IDL.

GRAMMAR AND TYPOGRAPHICAL ERRORS

While reading the paper are spotted a few grammatical and typographical errors that I bring to the attention of the authors here should they wish to correct them. In no way should this detract from the excellent quality of the paper.

We thank the reviewer for the very careful review and for pointing out these typos and grammatical issues.

Page 2, line 3: Replace "1980's" with "1980s". Apostrophes denote contraction or possession and this is neither. Similarly elsewhere in the paper.

Fixed.

Page 5, line 26: Replace "water data" with "water vapour data".

Done

Page 5, line 31: Replace "wit the SAGE" with "with the SAGE".

Done

Page 6, line 11: Either the delete the "approximately" or the ~

Done

Page 6, line 29: I would prefer to see "ground-based measurements" rather than "ground-based data".

Done

Page 7, line 5: Replace "extinctions" with "extinction".

Done

Page 7, line 26: Delete the second "(100 – 1 hPa)".

Done

Page 7, line 27: Replace "is provided" with "are provided".

Done

Page 9, line 30: Replace "to estimated" with "to the estimated".

Done

Page 10, lines 25-26: I don't know what is meant by "the statistical test does not account for seven".

This has been fixed.

Table 3: There is something anomalous with the "Period" entry for Samoa (looks like there are two sets of values).

Fixed

Page 12, line 2: Replace "is gridded" with "are gridded".

Fixed

Page 12, line 11: Replace "of “noise”." as "of as “noise”."

Done

Page 12, line 17: Replace "measurements are used" with "are used".

Done

Page 13, line 2: Replace "per decade" with "per decade in pressure".

Done

Figure 8 caption: Replace "RMMS" with "RMSS"

Done

Page 13, line 24: Replace "magnitude offsets" with "magnitude of the offsets".

Done

Page 14, line 17: Replace "on to" with "onto".

Done

Page 15, line 1: Replace "gridded data is" with "gridded data are".

Done

Page 17, line 15: Replace "samples $\pm 82^\circ$ latitude" with "samples between 82° S and 82° N".

Done

Page 18, line 21: Replace "clearly captures" with "clearly capture".

Done

Page 20, line 16: Replace "data is saved" with "data are saved".

Done

Page 20, line 27: Replace "new data is" with "new data are".

Done

Page 21, line 4: Replace "input in" with "input to".

Done

Page 22, line 4: Replace "algorithm removing" with "algorithm for removing".

Done